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MILITARY STANDARD

AUTOMATED INTERCHANGE OF TECHNICAL INFORMATION

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AREA IPSC

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FOREWORD

1. This military standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: CALS Evaluation and Integration Office, %CALS Digital Standards Office, HQ AFMC/ENCT, Wright-Patterson Air Force Base, OH 45433-5001, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

CONTENTS

CONTENTS

CONTENTS

CONTENTS

1. **SCOPE**

1.1 **Scope**. The purpose of this standard is to standardize the formats for exchange of digital information between organizations or systems exchanging digital forms of technical information necessary for the development and logistic support of defense systems throughout their life cycle. The initial areas addressed by this standard involved the interface with computer technologies which are automating the creation, storage, retrieval, and delivery of hard copy forms of technical manuals and engineering drawings. This revision of the standard also addresses electronic product data, new packaging of data for electronic trade business transactions, and electronic product data technology. When this standard is referenced by contract, it shall only apply to contract data called out in the Contract Data Requirements List (CDRL). Each item in the CDRL shall be annotated on the respective DD Form 1423 indicating that MIL-STD-1840 specifies the format for delivery. The content of the information to be delivered is defined by the Data Item Description (DID) referenced by the CDRL.

1.2 **Application**. This standard addresses technical information which is part of the traditional technical data package used for item acquisition, technical information used to design, manufacture, field, and dispose of an item, and the technical documentation used for item support. This includes information such as product data, product acquisition and implementation information, and product support data. Product data includes engineering drawings and specifications, but also includes new and evolving digital data forms that define parameters, features, and characteristics which enhance product functionality in a defense system and provide the data in a platform independent form directly usable by computer applications. Product acquisition and implementation information includes parameters, part numbers and codes, and other data necessary to manufacture, assemble and/or acquire the defense system, its supporting components, spares, and other equipment. Product support information includes training and maintenance manuals with their associated illustrations, and other data needed to bring the defense system to, and maintain, a required state of readiness. This military standard also standardizes the format and information structures of digital data files used for the transfer and archival storage of technical information in digital form. The format, information structures, and transfer procedures established herein are applicable in all cases where the information can be prepared and received in the form of American Standard Code for Information Interchange (ASCII) text files, product definition data files, raster image files, or graphics files. The standard is not restricted in any way in its application.

2. **REFERENCED DOCUMENTS**

2.1 **Government documents**.

2.1.1 **Specifications, standards, and handbooks**. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

PPP-B-636	-	Boxes, Shipping, Fiberboard.
PPP-C-1842	-	Cushioning Material, Plastic, Open Cell (for Packaging Purpose).

MILITARY

MIL-D-28000	-	Digital Representation for Communication of Product Data: IGES Application Subsets and IGES Application Protocols.
MIL-M-28001	-	Markup Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text.
MIL-R-28002	-	Requirements for Raster Graphics Representation in Binary Format.
MIL-D-28003	-	Digital Representation for Communication of Illustration Data: CGM Application Profile.

STANDARDS

MILITARY

MIL-STD-804	-	Formats and Coding of Aperture Cards.
MIL-STD-1806	-	Marking Technical Data Prepared by or for the Department of Defense.

HANDBOOKS

MILITARY

MIL-HDBK-59	-	Department of Defense Computer-aided Acquisition and Logistic Support (CALS) Program Implementation Guide.
MIL-HDBK-331	-	Directory of DoD Engineering Data Repositories.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Document Order Desk, Building 4D, 700 Robbins Ave, Philadelphia, PA 19111-5094.)

2.2 **Non-Government publications**. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 8879-1986	-	Information processing - Text and Office Systems - Standard Generalized Markup Language (SGML).

(Copies are available from the Standardization Document Order Desk, Building 4D, 700 Robbins Ave, Philadelphia, PA 19111-5094, for issue to DoD activities only. All other requestors must obtain documents from the American National Standards Institute, 11 West 42nd Street, 13 Floor, New York, NY 10036.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI X3.4-1986	-	American National Standard Code for Information Interchange.
ANSI X3.27-1987	-	File Structure and Labeling of Magnetic Tapes for Information Interchange.
ANSI X3.39-1986	-	Recorded Magnetic Tape for Information Interchange (1600 CPI, P.G.).
ANSI X3.54-1986	-	Recorded Magnetic Tape for Information Interchange (6250 CPI, Group coded Recording).

(Application for copies should be addressed to American National Standards Institute, 11 West 42nd Street, 13 Floor, New York, NY 10036.)

ELECTRONIC INDUSTRIES ASSOCIATION (EIA)

EIA 548	-	Electronic Design Interchange Format (EDIF).
EIA 5670000	-	Commercial Component Model Specification.

(Application for copies should be addressed to the Electronic Industries Association, 2001 Pennsylvania Ave. North West, Washington, DC 20006.)

INSTITUTE FOR INTERCONNECTING AND PACKAGING ELECTRONIC CIRCUITS (IPC)

IPC-D-350	-	Printed Board Description in Digital Form.
IPC-D-351	-	Printed Board Drawings in Digital Form.
IPC-D-352	-	Electronic Design Data Description for Printed Boards in Digital Form.
IPC-D-354	-	Library Format Description for Printed Board Digital Form.
IPC-D-356	-	Bare Board Electrical Test Information in Digital Format.

(Application for copies should be addressed to the Institute for Interconnecting and Packaging Electronic Circuits, 7380 N. Lincoln Ave., Lincolnwood, IL 60646.)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1076 - VHSIC Hardware Description Language (VHDL).

(Application for copies should be addressed to The Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th Street, New York, NY 10017.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 **Order of precedence**. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. **DEFINITIONS**

3.1 **Acronyms and abbreviations used in this standard**.

a. **3D** Three Dimensional

b. **AFB** Air Force Base

c. **ANSI** American National Standards Institute

d. **ASCII** American Standard Code for Information Interchange

e. **BOT** Beginning Of Tape

f. **CAGE** Commercial and Government Entity

g. **CALS** Computer-aided Acquisition and Logistic Support

h. **CDRL** Contract Data Requirements List

i. **CGM** Computer Graphics Metafile

j. **CPI** Characters Per Inch

k. **DID** Data Item Description

l. **DoD** Department of Defense

m. **DODISS** Department of Defense Index of Specifications and Standards

n. **DTD** Document Type Definition

o. **ECN** Engineering Change Notice

p. **EDI** Electronic Data Interchange

q. **EDIF** Electronic Design Interchange Format

r. **EIA** Electronic Industries Associations

s. **EOT** End Of Tape

t. **FOSI** Formatting Output Specification Instance

u. **GMT** Greenwich Mean Time

v. **GOSIP** Government Open Systems Interconnection Profile

w. **IGES** Initial Graphics Exchange Specification

x. **IEEE** Institute of Electrical and Electronics Engineers

y. **IPC** Institute for Interconnecting and Packaging Electronic Circuits

z. **ISO** International Organization for Standardization

aa. **OASD** Office of the Assistant Secretary of Defense

ab. **OSD** Office of the Secretary of Defense

ac. **PDL** Page Description Language

ad. **POC** Point of Contact

ae. **SGML** Standard Generalized Markup Language

af. **TM** Tape Mark

ag. **VHDL** VHSIC Hardware Description Language

ah. **VHSIC** Very High Speed Integrated Circuit

3.2 **Application profiles for CGM**. A set of specifications (beyond that in the published standard) appropriate to a particular environment. The goal of an application profile is to eliminate implementation dependencies and to provide for the effective and unambiguous use of a standard.

3.3 **Application protocol**. Defines the context for the use of product data and specifies the use of the standard in that context to satisfy an industrial need.

3.4 **Application subset for IGES**. A defined set of specific entity types which are used to completely and unambiguously represent the information requirements for a particular application.

3.5 **Array**. An n-dimensional ordered set of data items identified by a single name and one or more indices, so that each element is individually addressable.

3.6 **ASCII character set**. The ASCII character set includes 128 upper and lower case letters, numerals, and special purpose symbols, each encoded by a unique 7-bit or 8-bit binary number.

3.7 **ASCII text**. A sub-set of the ASCII character set consisting principally of the printable characters.

3.8 **Commercial and Government Entity (CAGE) Code**. A five character code listed in Cataloging Handbook H4/H8, Commercial and Government Entity (CAGE) Code, which is assigned to commercial and Government activities that manufacture or develop items, or provide services or supplies for the Government. When used with a drawing number or part number, the CAGE Code designates the design activity from whose series the drawing or part number is assigned.

3.9 **Component**. Items that are usually packaged as an indivisible unit to be assembled on a board or substrate. Examples include integrated circuits, resistors, capacitors, inductors, transformers, discrete transistors, DIP switches, fuses, and encapsulated relays.

3.10 **Computer Graphics Metafile (CGM)**. The specification for a mechanism for storing and transferring picture description information.

3.11 **Data element**. A uniquely named and defined component of a data definition; a data "cell" into which data items (actual values) can be placed (e.g., the data element AGE, into which items 1, 2, ..., can be placed).

3.12 **Data file**. A set of related records treated as a unit. For example, in stock control, a file could consist of a set of invoice records.

3.13 **Descriptive markup**. Markup that describes the structure and other attributes of a document in a non-system-specific manner, independently of any processing that may be performed on it. In particular, it uses tags to express the element structure.

3.14 **Destination system**. The computer hardware and software system receiving transferred data.

3.15 **Digital data**. Data represented in discrete discontinuous form as contrasted with analog data represented in continuous form.

3.16 **Document**. The term "document" applies to the information content of a variety of different printed or digital entities that contain technical information. These entities may be technical manuals, drawings, specifications, lists, engineering change notices, or other information, relating to the design, acquisition, manufacture, test, inspection, or maintenance of items. Technical information in digital form varies in its ability to be processed further while maintaining fidelity and integrity with the source data or product data it represents. Within this standard, use of the term "document" should be interpreted in that context (e.g., to what extent it is maintained as the source data for certain information).

3.17 **Document type**. A class of documents having similar characteristics; for example journal, article, technical manual, or memo.

3.18 **Document type declaration**. A markup declaration that contains the formal specification of a document type definition.

3.19 **Document type declaration set**. A declaration set intended for inclusion within a document type declaration. It consists of one or more entity sets and/or element type sets and/or short reference sets.

3.20 **Document Type Definition (DTD)**. Rules, determined by an application, that apply Standard Generalized Markup Language (SGML) to the markup of documents of a particular type. A document type definition includes a formal specification, expressed in a document type declaration, of the element types, element relationships and attributes, and references that can be represented by markup. It thereby defines the vocabulary of the markup for which SGML defines the syntax.

3.21 **Drawing**. An engineering document or digital data file(s) that discloses (directly or by reference), by means of graphic or textual presentations, or combination of both, the physical and functional requirements of an item.

3.22 **Electronic Data Interchange (EDI)**. The computer-to-computer exchange of formatted, transactional information between autonomous organizations.

3.23 **Electronic Design Interchange Format (EDIF).** A neutral, platform independent format for the interchange of integrated circuit design data from design to manufacturing organizations.

3.24 **Engineering data**. Engineering documents such as drawings, associated lists, accompanying documents, manufacturer's specifications and standards, or other information prepared by a design activity and relating to the design, manufacture, procurement, test or inspection of items.

3.25 **Engineering drawing**. See "drawing."

3.26 **File**. A digital repository of organized information consisting of records, items or arrays, and data elements.

3.27 **Format**. A specific arrangement of data.

3.28 **Illustration**. A picture, graph, diagram, or other form of graphical representation contained within a technical publication.

3.29 **Initial Graphics Exchange Specification (IGES)**. A specification for a file structure format, a language format, and the representation of geometric, topological, and non-geometric product definition data.

3.30 **Institute for Interconnecting and Packaging Electronic Circuits (IPC)**. Trade association and ANSI approved standards body which has developed printed circuit board standards.

3.31 **Markup**. SGML tags that are added to the data of a document in order to convey information about it.

3.32 **Media label**. A physical label affixed to each unit of digitally encoded media (e.g., magnetic tape, diskettes, optical disks, etc.) which identifies the origin, destination, and characteristics of the media.

3.33 **Media set**. A group of one or more units of a medium (e.g., magnetic tape, floppy diskettes, optical disks, etc.) which collectively represent the collection of related files comprising a specific delivery of a transfer package.

3.34 **Metafile**. A mechanism for retaining and transferring graphical data and control information. The information contains a device independent description of one or more graphic images.

3.35 **Page Description Language (PDL)**. A programming language to describe the displayable appearance of a page containing text, graphics, and sampled images. Used to communicate a high level, device independent description of a document between a composition system and a display system or printer.

3.36 **Pel**. The smallest graphic element that can be individually addressed within a picture.

3.37 **Product data**. All data elements necessary to define the geometry, function, and behavior of a piece part or an assembly of parts over its life span. The term includes all product definition data elements as well as additional logistics elements for reliability and maintainability.

3.38 **Product definition data**. Denotes the totality of data elements required to completely define a product. Product definition data includes geometry, topology, relationship, tolerances, attributes and features necessary to completely define a component part or an assembly of parts for the purpose of design, analysis, manufacture, test, and inspection.

3.39 **(Formal) Public identifier**. A PUBLIC identifier that is constructed according to rules defined in ISO 8879-1986 so that its owner identifier and the components of its text identifier can be distinguished.

NOTE: A PUBLIC identifier does not convey public usage rights to the entity it identifies. In particular, the owner of the entity may choose to sell or license it to others, or to restrict its access to a single organization.

3.40 **Raster**. A martix, constructed of orthogonally positioned rows and columns of discrete data points. The binary value of each data point indicates the presence or absence of a pictorial (visual) artifact. The aggregate of the artifacts, displaying their assigned values, represents a Raster Graphic.

3.41 **Raster graphics**. The presentation or storage of images in raster forms.

3.42 **Record**. A collection of related data elements treated as a unit.

3.43 **Source system**. The computer hardware and software that will structure technical information for interchange in accordance with this standard.

3.44 **Special word file.** A file of words peculiar to a transfer unitto which they are related and which are not in the destination system lexicon. This file may be used to facilitate other, as yet undefined, supporting textual information.

3.45 **Standard Generalized Markup Language (SGML)**. A standard that defines a language for document representation which formalizes markup and frees it of system and processing dependencies. It provides a coherent and unambiguous syntax for describing whatever a user chooses to identify within a document.

3.46 **System**. Specific suite of computer hardware and software. As used in the terms "Source System" and "Destination System," the term does not necessarily correspond one to one with "site" or "base" in that most prime contractor sites and DoD installations have more than one system.

3.47 **Tape volume**. A single reel of magnetic tape with recorded data.

3.48 **Transfer package**. A collection of one or more transfer sets (except sequential media where a transfer package is composed of exactly one transfer set).

3.49 **Transfer set**. A collection of one or more transfer units.

3.50 **Transfer unit**. A collection of files consisting of one transfer unit declaration file and one or more data files (the smallest collection of files to make a successful interchange of technical information).

3.51 **Transfer unit declaration file**. A file accompanying a set of data files comprising a transfer unit; provides all information necessary to the successful disposition of the digital files at the destination, but has no purpose beyond that function.

3.52 **Vector graphics**. The presentation of images stored as vector or other mathematical representations.

4. GENERAL REQUIREMENTS

4.1 **Purpose and coverage**. This standard covers the following types of transfer units for delivery in digital form:

a. Page image transfer unit.

b. Page Description Language (PDL) transfer unit.

c. SGML document transfer unit.

d. Product data transfer unit.

e. Miscellaneous transfer unit.

4.2 **Transfer unit contents**. Information covered by this standard consists of text, illustrations, and product data in digital form. This information shall be organized into transfer units for transmission or transfer. Each transfer unit shall be encoded in a format as specified by contract or other form of agreement. One transfer unit declaration file and at least one transfer unit data file, accompanied by the appropriate transfer unit data file header records shall constitute a transfer unit.

4.2.1 **Page image transfer unit**. A page image transfer unit shall consist of the following:

a. One transfer unit declaration file.

b. Page image files as specified by contract or other form of agreement (at least one page image file per transfer unit, mandatory).

c. Special word files as specified by contract or other form of agreement.

4.2.2 **Page Description Language (PDL) transfer unit**. A Page Description Language transfer unit shall consist of the following:

a. One transfer unit declaration file.

b. PDL files as specified by contract or other form of agreement (at least one PDL file per transfer unit, mandatory).

4.2.3 **SGML document transfer unit**. An SGML document transfer unit shall consist of the following:

a. One transfer unit declaration file.

b. Document type declaration file (one file per transfer unit; this file is optional unless otherwise specified by contract or other form of agreement).

c. SGML coded text source file (one file per transfer unit, mandatory).

d. SGML text entity files (one file for each text entity referenced in the transfer unit, mandatory). (Entities with PUBLIC identifiers need not be transmitted with the transfer unit when the receiver has access to a copy of the entity and knows it by that PUBLIC identifier.)

e. Illustration files in IGES format, CGM format or raster format, as specified by contract or other form of agreement. (Entities with PUBLIC identifiers need not be transmitted with the transfer unit when the receiver has access to a copy of the entity and knows it by that PUBLIC identifier.)

f. Formatting Output Specification Instance (FOSI) data file (one file per transfer unit, optional). (A FOSI with a PUBLIC identifier need not be transmitted with the transfer unit when the receiver has access to a copy of the FOSI and knows it by that PUBLIC identifier.)

g. Special word files as specified by contract or other form of agreement.

h. Contract defined data files as specified by contract or other form of agreement.

4.2.4 **Product data transfer unit**. A product data transfer unit shall consist of the following:

a. One transfer unit declaration file.

b. Engineering drawing data files in IGES or raster format as specified by contract or other form of agreement.

c. Electrical/electronic application data files as specified in 4.4.11.

d. Numerical control manufacturing data files.

4.2.5 **Miscellaneous transfer unit**. A miscellaneous transfer unit shall consist of the following:

a. One transfer unit declaration file.

b. At least one data file per transfer unit from the types listed in 4.4, as specified by contract or other form of agreement.

4.3 **Transfer unit declaration file format**. There shall be exactly one transfer unit declaration file with each transfer unit delivered in digital form. This transfer unit declaration file shall uniquely identify a transfer unit delivered in digital form and shall be prepared in accordance with the requirements of section 5 of this standard.

4.4 **Transfer unit data file formats**. The format for each type of transfer unit data file shall be as follows:

4.4.1 **Page image data files**. Page image data files shall be in accordance with the requirements of MIL-D-28000 for IGES data files, MIL-R-28002 for raster image data files, and MIL-D-28003 for CGM data files.

4.4.2 **Special word data files**. Special word data files shall be as specified by contract or other form of agreement.

4.4.3 **Page Description Language (PDL) data files**. PDL data files shall be as specified by contract or other form of agreement.

4.4.4 **Document type declaration files**. The document type declaration file shall contain the document type declaration set or the PUBLIC identifier for the SGML document being transmitted. If the SGML document transfer set does not contain a document type declaration file, then the document type declaration of the SGML document shall be the first data in the text source file. The requirement for a separate document type declaration file shall be as specified by contract or other form of agreement.

4.4.5 **Standard Generalized Markup Language (SGML) coded text source data files**. Text source data files shall be SGML coded, ASCII text files, marked up (tagged) in accordance with MIL-M-28001, as specified by contract or other form of agreement. If a document type declaration file is present in the SGML document transfer unit, then the text source file shall make up the document element of the SGML transfer unit; if there is no document type declaration file, then the text source file shall make up the document type declaration set or PUBLIC identifier followed by the document element.

4.4.6 **Standard Generalized Markup Language (SGML) text entity files**. The file shall contain the content of the SGML text entity in accordance with MIL-M-28001. The SGML text entity SYSTEM identifier or PUBLIC identifier shall be specified in the appropriate header record.

4.4.7 **Illustration data files**. Each set of text source files for a technical publication shall be supported with an illustration data file for each graphic entity in the technical publication except where there are multiple instances of the same graphic entity in different locations in the technical publication. In this situation, a single illustration data file may be used to satisfy all of the graphic entity instances. The illustration data files shall contain digital data encoded in raster, IGES, or CGM format.

4.4.7.1 **Initial Graphics Exchange Specification (IGES) illustration data files**. IGES illustration data files shall be in accordance with the requirements of MIL-D-28000, and shall be Class I or Class II application subsets as specified by contract or other form of agreement.

4.4.7.2 **Raster illustration data files**. Raster illustration data files shall be in accordance with the requirements of MIL-R-28002, and as specified by contract or other form of agreement.

4.4.7.3 **Computer Graphics Metafile (CGM) illustration data files**. CGM illustration data files shall be in accordance with the requirements of MIL-D-28003, which specifies such files in monochrome, gray scale, or full color format.

4.4.8 **Formatting Output Specification Instance (FOSI) data files**. FOSI data files shall be in accordance with MIL-M-28001 and shall define the style and display format of the document as specified by contract or other form of agreement.

4.4.9 **Contract defined data files**. Contract data file format shall be as specified by contract or other form of agreement.

4.4.10 **Engineering drawing data files**. The engineering data file representations of engineering drawings shall be only IGES or raster files. The specific form of the transferred files shall be as specified by contract or other form of agreement.

4.4.10.1 **IGES engineering drawing data files**. IGES engineering drawing data files shall be Class II application data subsets as specified by MIL-D-28000.

4.4.10.2 **Raster engineering drawing data files**. Raster engineering drawing data files shall be as specified by MIL-R-28002.

4.4.10.3 **Three-dimensional (3D) piping**. Three-dimensional piping data files shall be Class V application protocol as specified by MIL-D-28000.

4.4.11 **Electrical/electronic application data file format**. Electrical/electronic application data files shall be delivered in one or more of the following file formats as specified by contract or other form of agreement.

4.4.11.1 **Electronic Design Interchange Format (EDIF)**. Electrical/electronic application data files of this form shall be delivered in accordance with the EDIF product description and file format standard as defined in EIA 548.

4.4.11.2 **VHSIC Hardware Description Language (VHDL)**. Electronic application data files of this form shall be delivered in accordance with the VHDL product description and file format standard as defined in IEEE 1076. Application protocol will be in conformance with the following, in descending order of precedence:

a. The Data Item Description (DID) for VHSIC Hardware Description Language (VHDL) Documentation. Identification Number: DI-EGDS-80811.

b. The industry application protocol EIA 5670000 - Commercial Component Model Specification.

4.4.11.3 **IGES electrical/electronic application data files**. IGES electrical/electronic application data files shall be Class III application data subsets as specified by MIL-D-28000.

4.4.11.4 **Institute for Interconnecting and Packaging Electronic Circuits (IPC)**. Electrical/electronic applications data files of this form shall be delivered in accordance with the IPC product description and file format standard as specified by IPC-D-350 through IPC-D-352, IPC-D-354, and IPC-D-356.

4.4.12 **Numerical control manufacturing data files**. Numerical control manufacturing data files shall be Class IV application data subsets as specified by MIL-D-28000.

4.4.13 **Gray scale or color illustration data files**. Requirement for half-tone or color illustration shall be as specified by contract or other form of agreement.

5. DETAILED REQUIREMENTS

5.1 **General**. This section applies to all transfer media and specifies the structure, content, media options, and packaging requirements of the digital information which constitute a transfer package.

5.2 **Transfer package structure**. File naming, file types, and file structure set forth in this section shall be implemented on all media. A transfer package shall consist of one or more transfer sets except for sequential media which shall consist of one transfer set (see 5.4.1). The structure and content of each file shall conform to the requirements set forth in this section. Figure 1 provides a graphic representation of a transfer package.

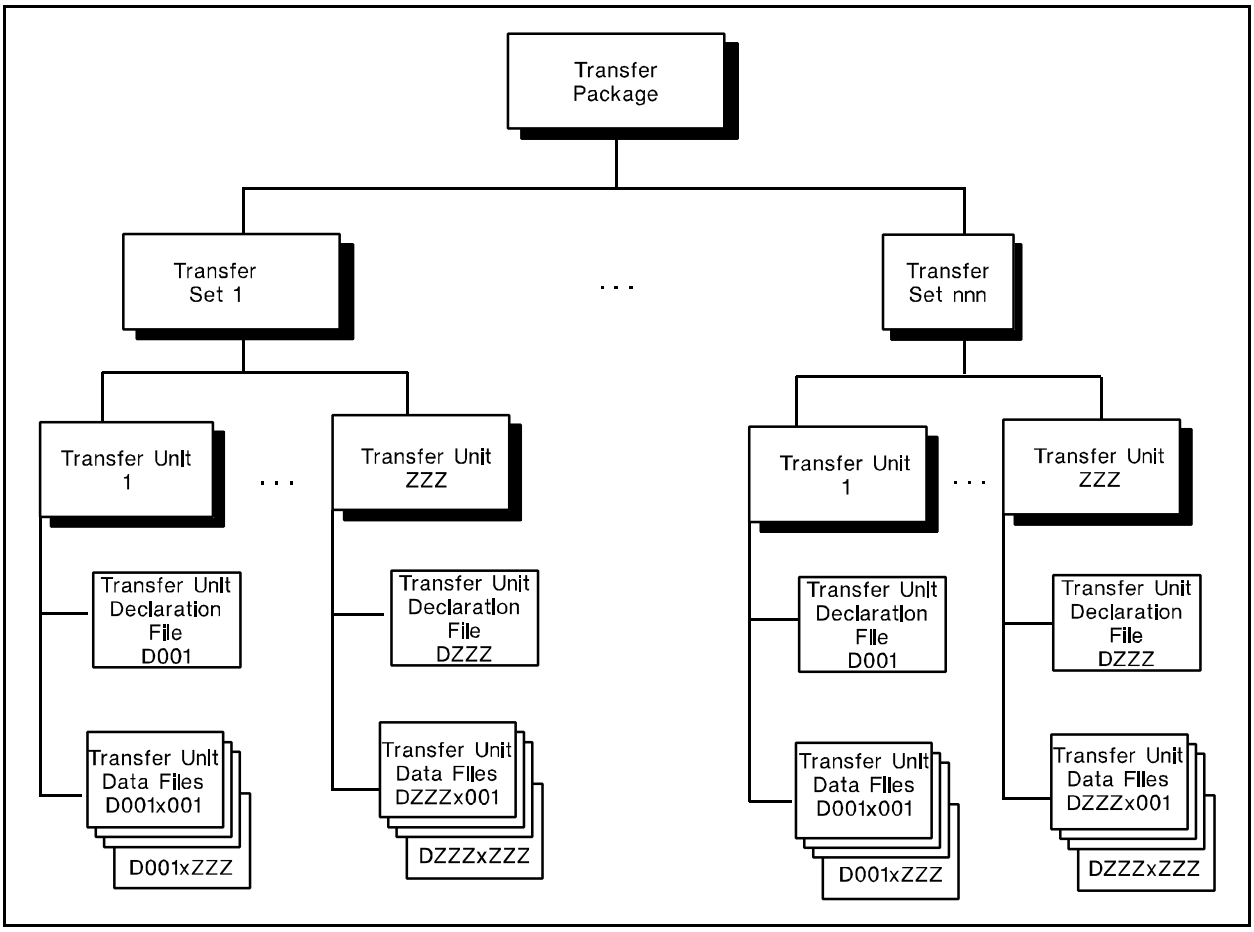

FIGURE 1. Transfer package contents.

5.3 **Transfer unit format**. This section specifies the naming convention, format, and content of transfer unit declaration files and transfer unit data files. A transfer unit shall consist of one transfer unit declaration file and at least one transfer unit data file. Specific types of transfer unit data files are described in section 4 of this standard.

5.3.1 **Transfer unit declaration file**. The transfer unit declaration file provides all information necessary to uniquely identify the transfer unit and contains the count of each transfer unit data file type contained in the transfer unit.

5.3.1.1 **Transfer unit declaration file name**. The file name used for each transfer unit declaration file shall be four characters long; the first character shall be "D"; the last three characters shall be the ASCII representation of an alphanumeric identifier for the transfer unit. This four character identifier provides a unique name for each transfer unit contained in a transfer set. The alphanumeric identifier for each transfer unit declaration file shall begin at "001" and shall be incremented for each transfer unit contained in a transfer set as follows:

a. After numbers "001" to "999" have been exhausted as identifiers, the ASCII upper case letters "A" to "Z" shall be used to lexicographically extend the set of identifiers.

b. The lexical progression shall occur from "001" to "ZZZ" as follows:

001...999,
A00...A09, A0A...A0Z, A10...A1Z, ..., AZ0...AZZ,
B00...B09, B0A...B0Z, B10...B1Z, ..., BZ0...BZZ,
.
.
.
Z00...Z09, Z0A...Z0Z, Z10...Z1Z, ..., ZZ0...ZZZ

5.3.1.2 **Transfer unit declaration file content**. The transfer unit declaration file shall be written in fixed length records of 128 bytes each. Each record has a dedicated use, and each record is required. All the data shall be in ASCII character format. Each record shall have a record identifier string from talbe I as the first characters in the record; the last two characters in the identifier string shall be a ":" (colon) and exactly one space character as a separator. Subsequent spaces are part of the data. Transfer unit declaration file records shall always occur in the order in which they are presented in table I. When data to be placed in a record exists (known or unknown) but is not supplied, the ASCII character string "EMPTY" shall be used. When the data required by a record is not applicable to the transfer unit, the ASCII character string "NA" shall be used. When data to be placed in a record does not exist, the ASCII character string "NONE" shall be used. The content of data appearing in transfer unit declaration file records shall be specified by contract or other form of agreement prior to actual transmission of a transfer package. An example of a declaration file is shown in figure 2.

TABLE I. Transfer unit declaration file records.

RECORD ID	RECORD NAME	DESCRIPTION
version:	Version	A character string containing the military standard, revision level, change level, and effective date of the revision of the standard under which the transfer unit is transmitted. For transfer units transmitted under this standard, the character string shall be: version: MIL-STD-1840B, 0, 19921103
srcsys:	Source system	A character string containing the name, address, and other information as specified by contract or other form of agreement needed to identify the system from which the transfer unit originated.
srcdocid:	Source system document identifier	The character string used by the source system to uniquely identify a document (e.g., a technical publication number, engineering drawing number, or database file set identifier).
srcrelid:	Source system related document identifier	A character string used by the source system to identify another document to which this document is closely related (e.g., this document is a supplement to another document).
chglvl:	Change/revision level and date of the document or product data	A character string indicating the revision, change level, and date of the change to the document or product data in the following format: chglvl: CHG TYPE, REV LEVEL, CHG LEVEL, DATE (See table II for an explanation of each entry for this record. The date format shall be YYYYMMDD/HHHH:SS.)
dteisu:	Date of issue of the document	This shall be the date and time of issue of the original document or the latest revision to the document. Date/time format shall be YYYYMMDD/HHHH:SS.
dstsys:	Destination system	A character string containing the name, address, and other information as specified by contract or other form of agreement needed to identify the destination system to which the transfer unit is going.
dstdocid:	Destination system document identifier	A character string used by the destination system to uniquely identify this document. This shall be the service or agency document number if one exists (e.g., a technical publication number or title, engineering drawing number, or database file set name).
dstrelid:	Destination system related document identifier	A character string used by the destination system to identify another document to which this document is closely related (e.g., this document is a supplement to another document).

TABLE I. Transfer unit declaration file records - Continued.

RECORD ID	RECORD NAME	DESCRIPTION
dtetrn:	Date of transfer	The date the transfer unit was transferred by the source system to the transmission media. Date format shall be YYYYMMDD/HHHH:SS.
dlvacc:	Delivery accounting	Free form record giving delivery information specified by contract or other form of agreement, such as contract number, CDRL item, etc.
filcnt:	File count	A character string count of the numbers of each type of data file in the transfer unit. Precede each file count with the letter from table III, used in the "data file name" to identify the type of file. Follow each number with a comma, except for the last. Spaces may be used as additional separators after each comma. For example, a record containing the string "T8, Q4, C1, R1" would indicate the transfer unit includes eight text files, four IGES files, one CGM file, and one raster illustration file. If there are no files of a particular type in a transfer unit, then the letter and file count are omitted.
ttlcls:	Title security label	A character string stating the security/sensitivity level or other restrictions on the title of the document.
doccls:	Document security label	A character string stating the highest security/sensitivity level or other restrictions on any file in the transfer unit.
doctyp:	Document type	A character string used by the source system to uniquely identify a document or engineering drawing type (e.g., supplement, job guide, schematic diagram, work card, assembly drawing, etc.).
docttl:	Document title	A character string identifying the document (e.g., a technical publication or engineering drawing title).
transacttyp:	Transfer unit type	A character string specifying the transfer unit type. Allowable transfer unit types shall be one of the following: PAGE IMAGE, PDL, SGML, PRODUCT DATA, MISCELLANEOUS

NOTE:
All date and date-time entries shall use the YYYYMMDD/HHHH:SS format, where YYYY is the calendar year, MM is the month, DD is the day of the month, HHHH is the hour using a 24 hour clock and SS is the seconds. All time references are based on Greenwich Mean Time (GMT).

TABLE II. Change level (chglvl:) header record entries.

CHG TYPE	MEANING	REV LEVEL	CHG LEVEL
ORIGINAL	The document or product data is the original.	0	0
ORIGINAL W/CHG	The document or product data is the original with changes incorporated.	0	Highest level change included
REVISION	The document or product data is a complete revision to a document or product data.	Indicates current revision level	0
REVISION W/CHG	The document or product data is a complete revision of a document or product data with changes incorporated	Indicates current revision level	Highest level change included
CHANGE	The document or product data is change material to an original, revision, or supplement	0	Highest level change included
OTHER	Used when none of the above change types applies	0	0

```
version: MIL-STD-1840B, 0, 19921103
srcsys: AJAX Inc. 100 Doe St, San Diego, CA  92110
srcdocid: Fire control system ver 14
srcrelid: F-18 avionics system ver 12
chglvl: REVISION W/CHG, G, 2, 19911201:1209:03
dteisu: 19890801/1200:00
dstsys: ABC System,  Wright-Patterson AFB, OH, 45433
dstdocid: 4SA6-11-4
dstrelid: 4SA6-11
dtetrn: 19920710:0900:31
dlvacc: CDRL item 6 of Contract N33400-93-C-1052, Due 19950731
filcnt: T8, Q4, C1, R1
ttlcls: Unclass
doccls: Unclass
doctyp: System schematic
docttl: F-18 fire control system
transacttyp: SGML
```

FIGURE 2. Example of a declaration file.

NOTE: The records "version:" and "transacttyp:" are not present in MIL-STD-1840A transfer units.

5.3.2 **Transfer unit data file types**. Transfer unit data files may be of the types shown in table III and shall be as specified below. Required data files not enumerated below shall be as specified by contract or other form of agreement.

a. Document type declaration and SGML coded text source files. If a document type declaration file is present in the SGML document transfer unit then the SGML coded text source file shall contain the document element of the SGML document transfer unit; if there is no document type declaration file, then the SGML coded text source file(s) shall contain the document type declaration set or PUBLIC identifier followed by the document element (the complete SGML document entity).

b. FOSI files. Consistent with MIL-M-28001.

c. Illustration files. Raster, IGES, or CGM format, containing the illustrations of the transfer set.

d. Product data files. Raster, IGES, VHDL, EDIF, or IPC format.

e. Page image files. Raster or CGM format.

f. Contract defined data and format.

g. Special word files. A special word file shall be as specified by contract or other form of agreement.

5.3.2.1 **Transfer unit data file name**. The file name for transfer unit data files shall be eight characters long, with the first four characters being the same as the transfer unit declaration file name (see 5.3.1.1). The fifth character shall be a code from table III, identifying the type of data file. The last three characters shall be a character representation of an alphanumeric identifier from "001" to "ZZZ" and the identifier shall increment sequentially for each transfer unit data file within the same transfer unit data file type for a given transfer unit, such that each transfer unit data file has a unique name represented by the first four and last four characters of the eight character string:

a. After numbers "001" to "999" have been exhausted as identifiers, the ASCII upper case letters "A" to "Z" shall be used to lexicographically extend the set of identifiers.

b. The lexical progression shall occur from "001" to "ZZZ" as follows:

001...999,
A00...A09, A0A...A0Z, A10...A1Z, ..., AZ0...AZZ,
B00...B09, B0A...B0Z, B10...B1Z, ..., BZ0...BZZ,
.
.
.
Z00...Z09, Z0A...Z0Z, Z10...Z1Z, ..., ZZ0...ZZZ

TABLE III. Data file name code letters and file format.

CODE LETTER	DATA FILE TYPE	FIXED RECORD LENGTH	BLOCK LENGTH
A	Contract defined data file	AS SPECIFIED BY CONTRACT	
C	CGM file	80	800
E	EDIF file	AS SPECIFIED BY CONTRACT	
G	Document type declaration file with no contained text data	256	2048
H	FOSI file	256	2048
I	IPC file	AS SPECIFIED BY CONTRACT	
N	SGML text entity file	AS SPECIFIED BY CONTRACT	
P	PDL file	AS SPECIFIED BY CONTRACT	
Q	IGES file	80	800
R	Raster file	128	2048
T	SGML coded text file	AS SPECIFIED BY CONTRACT	
V	VHDL file	80	1920
X	Special word file	AS SPECIFIED BY CONTRACT	
Z	Gray scale/color data file	AS SPECIFIED BY CONTRACT	

NOTE:
All data file header records shall be contained in the first logical block of the data file. Each header record shall be padded to the appropriate length by use of the space (" ") character (position 2/0 of the ASCII table). Data file header blocks shall be filled with the space (" ") character (position 2/0 of the ASCII table) to the appropriate length. The block size therefore determines the beginning of the actual data, regardless of any other impact it has on the data.

5.3.2.2 **Transfer unit data file header records**. Each data file shall have identifying header records in 7-bit ASCII and as specified by this section. The records shall contain only those characters permitted by ANSI X3.4-1986. Table IV is a complete list of all possible data file record identifiers. Each record identifier is followed in table IV by a description of the record and the specific restrictions on the content of the record. Table V specifies which records are mandatory for each data file type. Each data file shall contain the mandatory records shown in table V. Any additional records which may accompany the file are also identified in table V. Though not all header records are present in each data file type and not all values are required, data file header records shall always occur in the order in which they are listed in table IV. All data file header records shall be fixed length. Record lengths for A, E, I, N, P, T, X, and Z data file types shall be specified by contract or other form of agreement; record lengths for all other data file types shall be as specified in table III. Each record shall have a record identifier string from table IV as the first characters in

the record; the last two characters in the record identifier string shall always be a colon and then a space character. When alphanumeric data to be placed in a record exists (known or unknown) but is not supplied, the ASCII character string "EMPTY" shall be used. When alphanumeric data to be placed in a record does not exist, the ASCII character string "NONE" shall be used. The data type (dtype:) record data is numeric. When the data for this record is not provided, the ASCII character "0" shall be used. The header record shall be padded out by the use of blank space (" ") characters (position 2/0 of the ASCII table).

TABLE IV. Transfer set data file header records.

RECORD IDENT	RECORD NAME	DESCRIPTION
specversion:	Specification version	A character string identifying the document number, revision level, change level, and date of the specification the data file is in accordance with. The date format shall be YYYYMMDD. Example: specversion: MIL-R-28002 19881220
srcdocid:	Source system document identifier	This is a character string used by the source system to uniquely identify this document (e.g., the technical publication number) to which this file belongs, comprises, or applies. 1. This character string shall be the same as the source system document identifier (srcdocid:) of the transfer unit declaration file except for product data transfer units. 2. For product data transfer units, the first 69 bytes of the "srcdocid: " header record shall be as specified in table VI. The remaining bytes shall be padded with ASCII space characters or used as specified by contract or other form of agreement. This format facilitates the transfer of information included when the product data originates in aperture card form or is required for subsequent issue in that form.
dstdocid:	Destination system document identifier	This character string shall be the same as the destination system document identifier (dstdocid:) of the transfer unit declaration file. The parenthetical words "(Multiple Documents)" shall be appended to the identifier if the entity is intended for use in more than one transfer unit.
datfilid:	Data file identifier	This record shall contain the contract specified description, identifying the content and processing of this file. For example, the contract might require this record to indicate the type of processing needed to use the data.

TABLE IV. Transfer set data file header records - Continued.

RECORD IDENT	RECORD NAME	DESCRIPTION
moduleid:	Module identifier	For SGML document file sets, this is the PUBLIC identifier by which this module is known in the SGML document. If there is a document type declaration file, the "moduleid: " for the document type declaration file and SGML coded text file shall be identical. For an SGML external entity that has no PUBLIC identifier, the "moduleid: " shall be the entity name from the entity declaration in the transfer element Document Type Declaration.
dtype:	Data type	This record shall contain an ASCII character string containing an integer that indicates the type or scope of the data contained in the file. The numeric representations will be integers beginning with "1" for each appropriate data specification. They shall be assigned sequentially to each type of data defined by the data specification (e.g., MIL-R-28002 defines Type I Raster and Type II Raster which are assigned dtype: of "1" and "2" respectively). Data types given in the data specifications shall be used. If no data type is given in the data specification, the ASCII character "0" (position 3/0 of the ASCII table) shall be used.
rorient:	Raster image orientation	Two, right-justified, three character strings separated by a comma specifying respectively the direction of the progression of successive pels along a line relative to the horizontal and the direction of the progression of successive lines relative to the pel path. If more than one value is applicable to the data file, the ASCII character string "MIXED" shall be used. Permissible and default pel path and line direction values are listed in MIL-R-28002.
rpelcnt:	Raster image pel count	Two, right-justified, six character strings separated by a comma specifying the integer count of pels in the pel path direction, and lines in the line progression direction. If more than one value is applicable to the data file, the ASCII character string "MIXED" shall be used.
rdensty:	Raster image density	One, right-justified, four character string representing the numerical value of the raster image density. If more than one value is applicable to the data file, the ASCII character string "MIXED" shall be used. Permissible and default image density values are listed in MIL-R-28002.
didid:	Data Item Description identifier	This record shall contain the applicable Data Item Description identification number.
doccls:	Data file security label	Character string stating the security/sensitivity level or other restrictions on the data file.

TABLE IV. Transfer set data file header records - Continued.

RECORD IDENT	RECORD NAME	DESCRIPTION
fosipubid:	PUBLIC identifier of an associated FOSI	For the document type declaration or text source file containing the document type declaration of the document being transmitted, this string is the established PUBLIC identifier of the FOSI to be used in formatting the document. If the FOSI for the document does not have an SGML PUBLIC identifier established, this record may be omitted from the document type declaration or text source file. This header record shall not be used with any text source file that does not contain the document type declaration.
notes:	Notes	Notes shall consist of free form text consistent with the number of characters permitted for records in this file.

TABLE VI. Source system document identifier (srcdocid:) record content.

Position	Data Element Name	Content
1 -10	Record Identifier	The character string "srcdocid: " includes a "space" character in the tenth position following the colon.
11-12	Document Type	Code identifying the document type that this image represents or is a part of. Use the "type code" specified in MIL-STD-804 unless otherwise specified by contract or other form of agreement.
13-27	Document Identifier	Alpha numeric sequence assigned by the originating organization or as specified by contract or other form of agreement. This must be an identifier unique to the assigning organization (e.g., drawing number, parts list number, document identifier for a Defense Standardization Program document).
28-32	CAGE Code	Commercial and Government Entity (CAGE) Code of the original design facility, agency, or company as indicated on the drawing or document.
33-34 a rj	Revision Letter	Sheet/image revision level - if there are multiple sheets/images to the document, then sheet/image one will identify the highest revision level of the set. If the revision level is numeric, convert to an alpha using table VII.
35-36 a/n	Accompanying Document Kind	Code identifying the type of document accompanying the document identified in position 11-34. Use the "type code" specified in MIL-STD-804 unless otherwise specified by contract or other form of agreement. (This is used to identify accompanying and related ECN's, etc.)
37-43 a/n	Accompanying Document Identifier	Alpha numeric sequence assigned by the originating organization or as specified by contract or other form of agreement. This must be an identifier unique to the assigning organization (e.g., drawing number, parts list number, document identifier for a Defense Standardization Program document).
44 a	Accompanying Document Revision	Accompanying document revision level - if the revision level is numeric, convert letter to an alpha using table VII.
45-48 a/n	Weapon System Code	Code assigned to the weapon system by contract.

LEGEND: rj = right justified.
n = numeric with leading zeroes.
a/n = alpha/numeric followed by blanks.
a/n rj = appha/numeric right justified.

TABLE VI. Source system document identifier (srcdocid:) record content - Continued.

Position	Data Element Name	Content
49-52 n	Image Number	Number assigned to the image in accordance with table VIII.
53-56 n	Total Number of Images	The total number of file images per individual sheet-page of a document shall be used - see table VIII, (for Army this equals images for a specific number of drawing revision level).
57	Data Rights	A code identifying the data rights associated with the document. This code shall be specified by contract or other form of agreement.
58-59	Control Activity	Use the code listed in MIL-HDBK-331 for the control activity identified by contract or other form of agreement.
60	Format Code	Identify the format code (H or T format as defined in MIL-STD-804) to be used when punching the data of this record on an aperture card.
61	Security Classification	Identify the security classification assigned to the sheet/image. Use the appropriate code as specified by contract or other form of agreement.
62-65 rj	Sheet Number	A document sheet/page identification shall be used - see table VIII.
66-67 rj	Drawing Size	Identify the drawing size. (Acceptable size codes are A to K and A4 to A0).
68	Distribution	Identify the distribution code in accordance with MIL-STD-1806.
69	Data Control Code	Identify the export data control code in accordance with MIL-STD-1806.

LEGEND: rj = right justified.
n = numeric with leading zeroes.
a/n = alpha/numeric followed by blanks.
a/n rj = alpha/numeric right justified.

TABLE VII. Numeric to alpha conversion chart.

N	A	N	A	N	A	N	A	N	A
1	A	45	BE	89	DJ DK	133 134	FN	177 178	HU
2	B	46	BF	90	DL	135	FP	179	HV
3	C	47	BG	91	DM	136 137	FR	180 181	HW
4	D	48	BH	92	DN DP	138	FT FU	182	HY
5	E	49	BJ	93	DR	139 140	FV	183 184	JA
6	F	50	BK	94	DT DU	141	FW FY	185	JB
7	G	51	BL	95	DV	142 143	GA	186 187	JC
8	H	52	BM	96	DW	144	GB GC	188	JD
9	J	53	BN	97	DY EA	145 146	GD	189 190	JE
10	K	54	BP	98	EB EC	147	GE	191	JF
11	L	55	BR	99 100	ED EE	148 149	GF GG	192 193	JG
12	M	56	BT	101 102	EF EG	150	GH GJ	194	JH
13	N	57	BU	103	EH	151 152	GK	195 196	JJ
14	P	58	BV	104 105	EJ	153	GL	197	JK
15	R	59	BW	106	EK	154 155	GM	198	JL
16	T	60	BY	107	EL	156	GN	199	JM
17	U	61	CA	108 109	EM	157 158	GP	200	JN
18	V	62	CB	110	EN	159	GR	201	JP
19	W	63	CC	111	EP	160	GT	202 203	JR
20	Y	64	CD	112	ER	161 162	GU	204	JT
21	AA	65	CE	113 114	ET	163	GV	205	JU
22	AB	66	CF	115	EU	164	GW	206	JV
23	AC	67	CG	116	EV	165	GY	207	JW
24	AD	68	CH	117	EW	166 167	HA	208	JY
25	AE	69	CJ	118	EY	168	HB	209	KA
26	AF	70	CK	119	FA	169	HC	210	KB
27	AG	71	CL	120	FB	170 171	HD	211	KC
28	AH	72	CM	121	FC	172	HE	212	KD
29	AJ	73	CN	122	FD	173 174	HF	213	KE
30	AK	74	CP	123	FE	175	HG	214	KF
31	AL	75	CR	124	FF	176	HH	215	KG
32	AM	76	CT	125	FG		HJ	216	KH
33	AN	77	CU	126	FH		HK	217	KJ
34	AP	78	CV	127	FJ		HL	218 219	KK
35	AR	79	CW	128	FK		HM	220	KL
36	AT	80	CY DA	129	FL		HN		KM
37	AU	81	DB	130	FM		HP		KN
38	AV	82	DC	131			HR		KP
39	AW	83	DD DE	132			HT		KR
40	AY	84	DF						KT
41	BA	85	DG						KU
42	BB	86	DH						KV
43	BC	87							KW
44	BD	88							KY

NOTES:
1. N-Numeric; A-Alphabetic
2. Letters I ,O, Q, S, X, and Z are not to be used

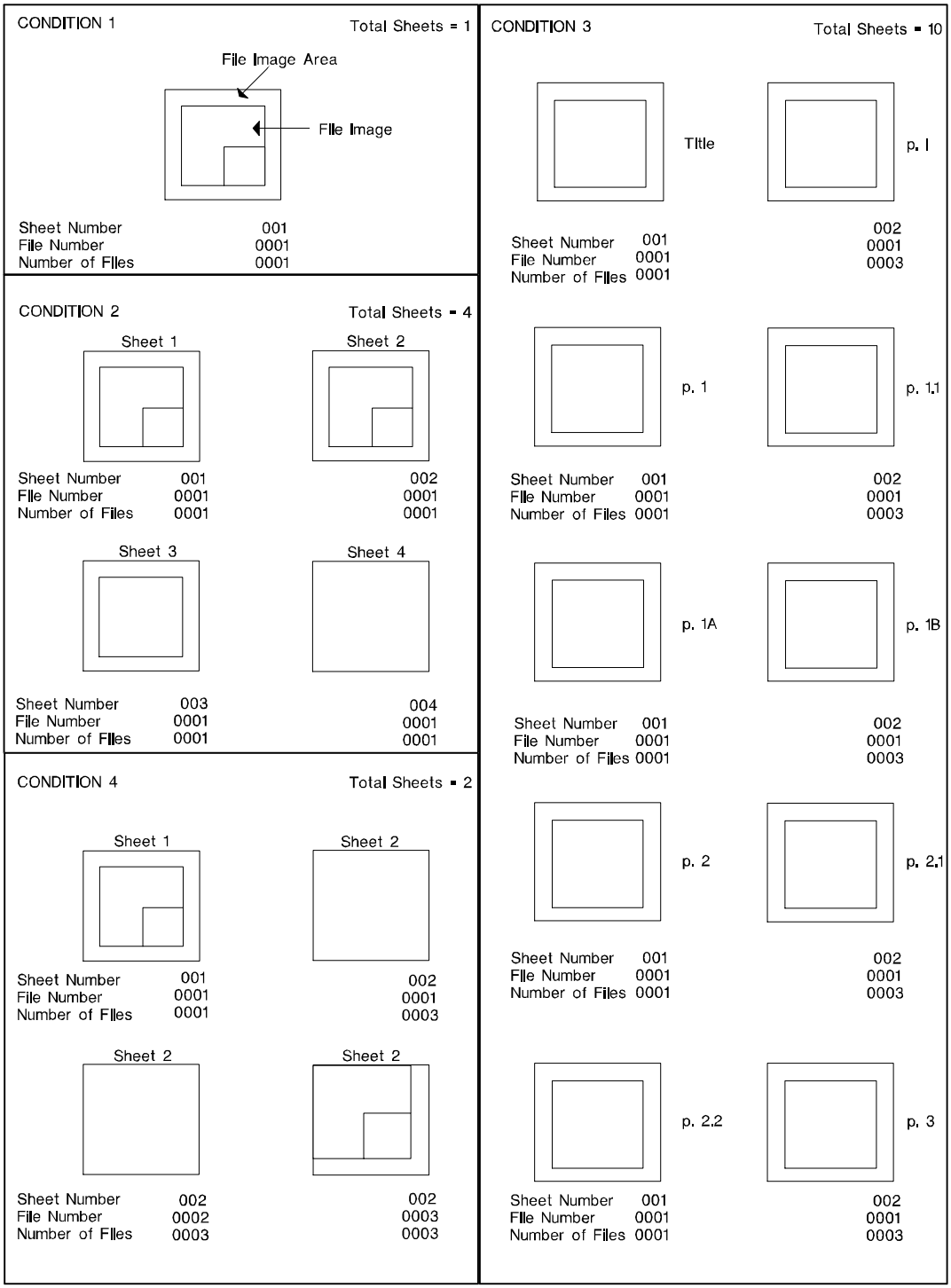

FIGURE 3. Image content examples.

5.4 **Media options**. This section specifies the details of the transfer media preparation. All media shall implement the file type(s) specified in this section. All media shall permit the transmission of a transfer package. Some types of media may permit the transmission of more than one transfer package on a single unit of that medium. The location, arrangement, or other structuring of transfer packages on the medium is as agreed upon by mutual consent. The location, arrangement, or other structuring of transfer sets, transfer units, and files within a transfer package is as specified in this section.

5.4.1 **Magnetic tape (sequential media)**. Transfer packages for sequential media shall be limited to a single transfer set. Specific structure and labeling for sequential media other than 9-track magnetic tape shall be as specified by contract or other form of agreement. File structure and labeling of 9-track magnetic tapes for delivery of the files to a destination system shall be written in accordance with ANSI X3.27-1987. The tape volume labels and file labels shall comply with Level 1, 2, 3, or 4 of ANSI X3.27-1987. All records shall be fixed length implementing ANSI type-F fixed length record files. Acceptable recording densities for 9-track magnetic tape are 1600 CPI and 6250 CPI only on 9-track magnetic tapes in accordance with ANSI X3.39-1986 and ANSI X3.54-1986, respectively. The 17 character ANSI file label field shall contain the file name of the associated transfer unit declaration file (see 5.3.1.1) or transfer unit data file (see 5.3.2.1).

5.4.1.1 **Transfer unit declaration file for sequential media**. The transfer unit declaration file content for sequential media shall be in accordance with 5.3.1. The maximum block length of a transfer unit declaration file for sequential media shall be 2048 bytes.

5.4.1.2 **Transfer unit data files for sequential media**. The record type, record length and block length required for the various data files shall be in accordance with table III. The appropriate header records as defined in 5.3.2.2, shall be written in the first physical block of the file with the block padded to the appropriate block size using the space (" ") character (position 2/0 of the ASCII table). The second and subsequent blocks of the file shall contain the data encoded in the appropriate data form for the type of data file being transferred.

5.4.1.3 **Order of files for sequential media**. Files within a transfer set written to sequential media shall be ordered as follows:

a. For transfer sets which contain one transfer unit, the transfer unit declaration file shall be the first file written to the media followed by all associated transfer unit data files. The transfer unit data files may be written in any order.

b. For transfer sets which contain more than one transfer unit, all transfer unit declaration files shall be written as a contiguous group and precede all transfer unit data files in order to facilitate locating a specific transfer unit. Transfer unit data files may be written in any order, but transfer unit data files of each transfer unit shall form a contiguous group. These groups of transfer unit data files shall be written in the same order as the respective transfer unit declaration files.

5.4.1.4 **Volume identifier**. The tape volume identifier shall consist of a six character name; the first four characters are arbitrarily assigned to identify the set and the last two are the tape number. The tape number for the first tape shall be "01"; subsequent tape numbers shall increase sequentially beginning with "02". The character set shall be limited to the ASCII number 0-9 and upper-case letters. The first character of the

volume name shall be an upper-case letter. The owner and accessibility fields of the volume label shall be ignored when the tapes are read into the destination system.

5.4.1.5 **Volume tape set example**. Figure 4 shows a representative tape volume and file configuration written in ANSI Level 3 format.

a. Following at the physical beginning of tape (BOT) mark on the tape shall be the volume header (VOL1).

b. The first file shall immediately follow the volume header label (VOL1). Each file shall be encoded on the tape as follows with only one exception:

(1) File Header Labels (HDR1, HDR2, . . . HDR9)
(2) Tape Mark (TM)
(3) File Section (data encoded into appropriate blocks)
(4) Tape Mark (TM)
(5) End Of File Header Labels (EOF1, EOF2, . . . EOF9)
(6) Tape Mark (TM)

The last file in a tape volume set shall be followed by a second consecutive tape mark.

c. The exception occurs when the End Of Tape (EOT) is encountered while one of the items listed in 5.4.1.5.b is being written. In this case, the following items shall be written immediately after the current operation (if the current operation is writing a data block) or after the next data block is written.

(1) Tape Mark (TM)
(2) End Of Volume Header Labels (EOV1, EOV2, . . . EOV9)
(3) Tape Mark (TM)
(4) Tape Mark (TM)

(New Volume; reel of tape)

(5) Volume Header Label (VOL1)
(6) File Header Labels (HDR1, HDR2, . . . HDR9)

d. If the last data block written in 5.4.1.5.c is the end of the data file, and the last data file in the transfer set, the following items shall be written instead:

(1) Tape Mark (TM)
(2) End Of File Header Labels (EOF1, EOF2, . . . EOF9)
(3) Tape Mark (TM)
(4) Tape Mark (TM)

(Labels HDR3-9, EOF3-9, EOV3-9 may be written by the sending system. The destination system must be able to ignore these labels if the destination system cannot process them.)

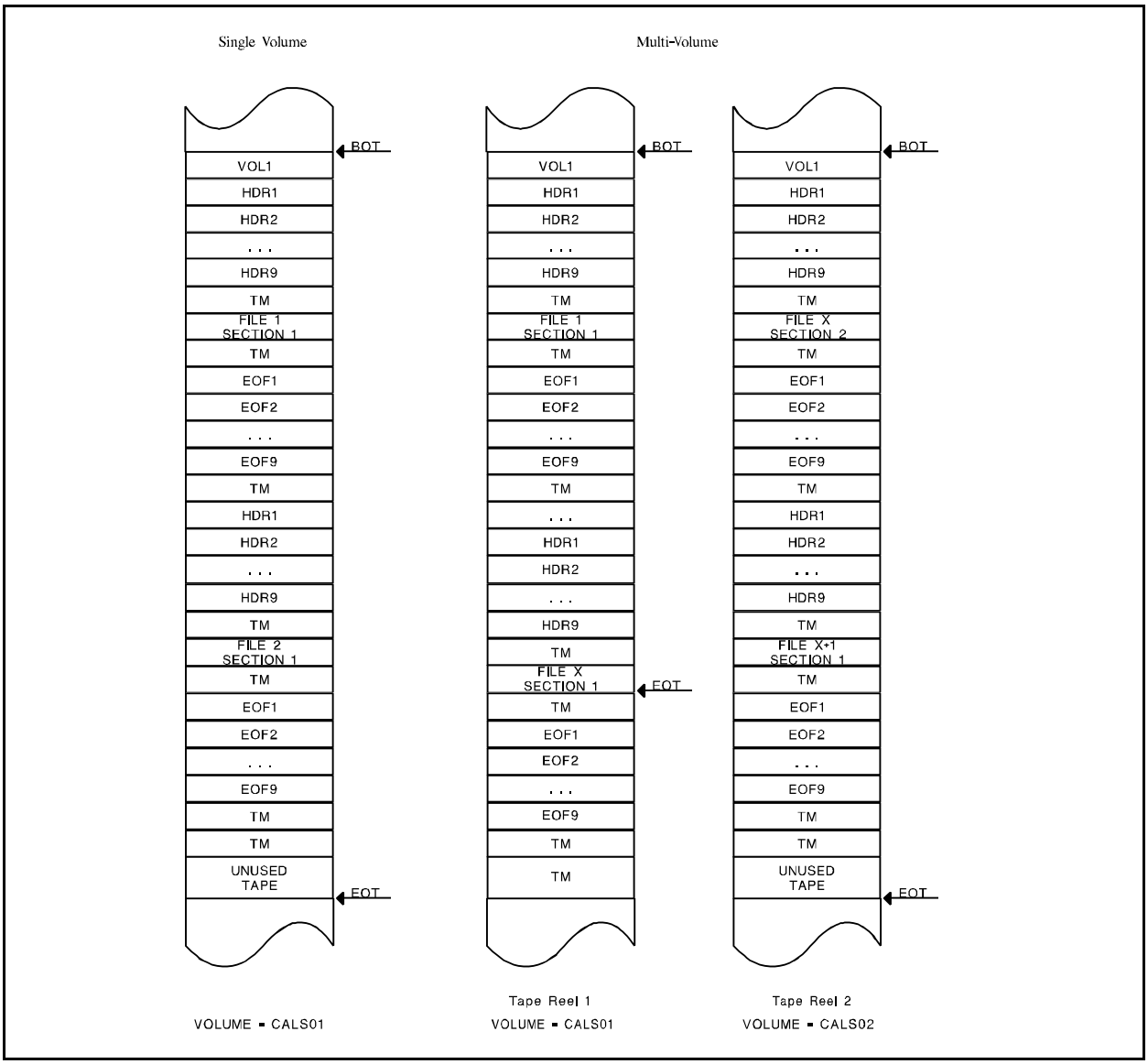

FIGURE 4. Volume tape set example.

5.4.2 **Alternative media**. Unless otherwise specified, the medium for delivery shall be 9-track magnetic tape as required by 5.4.1; alternatively, other physical media may be used by mutual consent of the parties involved in the data transfer. Other alternative mechanisms for automated exchange, such as EDI, may be used by mutual consent of the parties involved in the data transfer. MIL-HDBK-59 provides guidelines for data transfer and alternatives. For media other than 9-track magnetic tape, the location, arrangement or other structuring of files within a transfer unit package is as agreed upon by mutual consent.

5.4.2.1 **Transfer unit declaration file**. The transfer unit declaration file shall be in accordance with 5.3.1 and all of its subparagraphs.

5.4.2.2 **Transfer unit data files**. Record length required for the various transfer unit data files shall be in accordance with table III. Header records shall occur at the beginning of each data file in accordance with 5.3.2.2

5.5 **Packaging**. The sender of digitally encoded transfer packages shall be responsible for protection of the transfer medium or media sets.

5.5.1 **Media Labeling**. All transfer media shall have a media label affixed to it. The media label shall contain the following information as a minimum (figure 5 is an example of a media label):

a. Company name/Government organization - This is the company name or Government organization of the sender.

b. Date - This is the date the transfer package was transferred by the source system to the transmission media, the format shall be YYYYMMDD/HHHH:SS.

c. Version - A character string containing the military standard, revision level, change level, of the standard under which the transfer unit is transmitted. For transfer units transmitted under this standard, the character string shall be: version: MIL-STD-1840B, 0

d. CAGE code - Commercial and Government Entity (CAGE) code of the sender.

e. Volume ID - See 5.4.1.4.

f. Density/Capacity - The density of the tape (e.g., 1600 CPI or 6250 CPI) or the capacity of the alternative media (e.g., 1.2 megabytes, 1.44 megabytes, etc.).

g. Media number - Provides the sequence number of the specific volume for multi-volume media sets (e.g., 1 of 2, 2 of 2).

h. Point of Contact (POC) - The name, phone number, and organization of a person who is knowledgeable about the contents of the transfer unit and who may be contacted for detailed information.

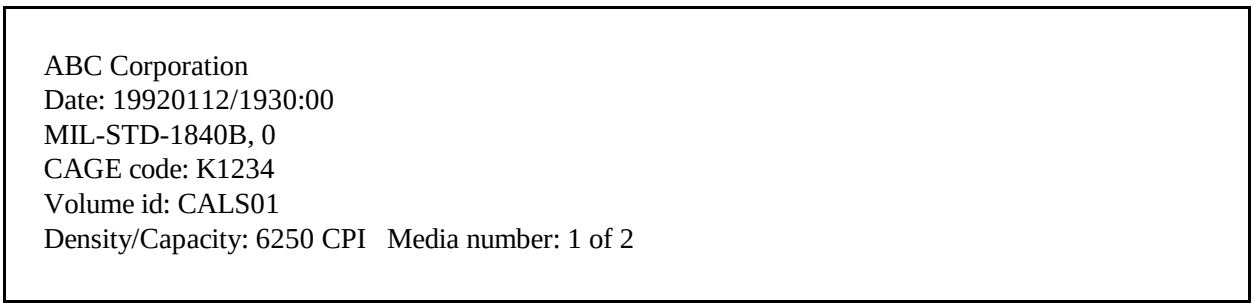

FIGURE 5. Example of a media label.

5.5.2 **Encoded magnetic computer media**. A packing slip showing the names and volume numbers of each reel or disk shall be included in each package. A printed listing of the included transfer unit declaration files shall be on the packing slip or attached to it.

5.5.2.1 **Protection**. Encoded magnetic tapes, disks, and other electromagnetically inscribed information transfer media shall be protected against dirt, moisture, and electrostatic discharge damage. For 9-track magnetic tape, place the protected tape(s) in a PPP-B-636 conforming box, allowing enough space for the addition of cushioning material. Fill the extra internal box spaces with PPP-C-1842 conforming cushioning material. For transfer media other than 9-track magnetic tape, the media shall be protected against dirt, moisture, and electrostatic discharge damage and packaged for shipment using best commercial practices.

5.5.2.2 **Marking**. Encoded magnetic computer tape or disk shipping containers shall be conspicuously labeled with a warning as shown in figure 6.

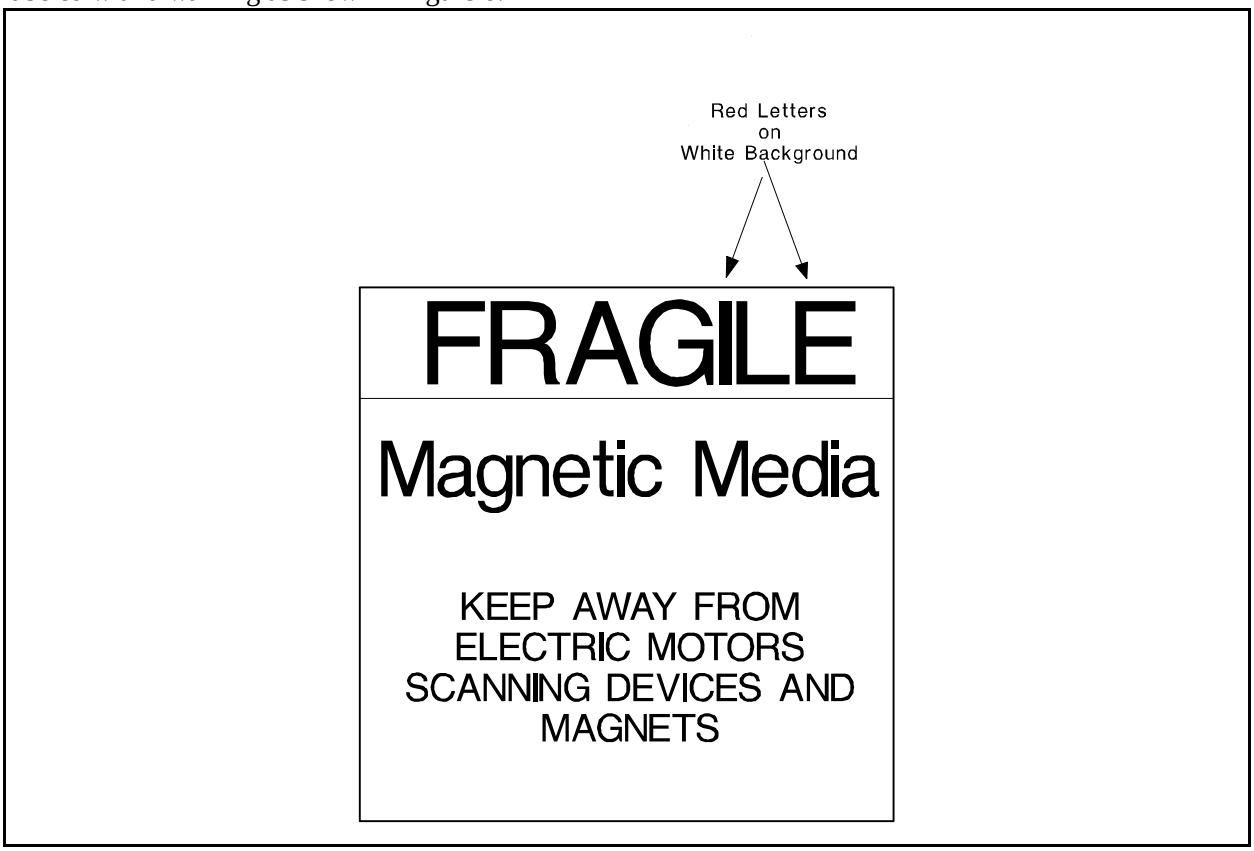

FIGURE 6. Example of a warning label.

5.5.3 **Other computer media**. Instructions for protection, packaging, and marking shall be as specified by contract or other form of agreement.

6. **NOTES**

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 **Intended use**. This standard directs the application of standards and specifications which are intended to provide the capability for reliable and economical transfer of various digital representation forms of technical information. The standards implemented herein have been chosen because they are widely supported and accepted by national or international standards bodies. Because of the rapidly evolving technology, many of these standards are themselves evolving significantly, and will be further implemented in future revisions of this standard.

6.2 **Issue of DODISS**. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.1.1, and 2.2).

6.3 **Tailoring guidance**. To ensure proper application of this standard, invitations for bids, requests for proposals, and contractual statements of work should tailor the requirements in sections 4 and 5 of this standard to exclude any unnecessary requirements. For example, where the term "as specified by contract or other from of agreement" is encountered in sections 4 and 5, agreement between sender and receiver is needed to ensure complete and successful transfer of data.

6.4 **Destination/source system**. Throughout this standard, the phrases "source system" and "destination system" are used in lieu of any specific designation of a military service or DoD agency. This convention does not preclude this standard from being used for information transfer between DoD agencies, non-DoD agencies, or private sector organizations.

6.4.1 **Telecommunications**. GOSIP will be able to interoperate with the DoD protocols; it is, therefore, encouraged that acquisitions of telecommunication products require the delivery of systems that satisfy the data communication protocol specifications of GOSIP.

6.5 **File name and media limitations**. For individual transfer units, when the maximum number of uniquely identifiable transfer unit data files is exceeded, the transfer unit should be divided into two or more transfer units within a transfer set. For a transfer set, when the maximum number of uniquely identifiable transfer unit declaration files is exceeded, the transfer set should be divided into two or more transfer sets within a transfer package. Sequential media is limited to a single transfer set within a transfer package; therefore, when the maximum number of uniquely identifiable transfer unit declaration files is exceeded, the transfer package should be divided into two or more transfer packages. Transfer packages for magnetic tape should be limited to three tape volumes where practical.

6.6 **Subject term (key word) listing**. The following subject terms (key words) are applicable:

Computer Graphics Metafile
Initial Graphics Exchange Specification
Language, Page Description
Manuals, technical
Publications, technical

Publishing, electronic
Raster
Standard Generalized Markup Language

6.7 **Changes from previous issue**. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - SH
Air Force - 24
DLA - DH

Preparing Activity:
OASD (P&L)-DO

Agent:
Air Force -16

(Project IPSC - 0270)

Review activities:
Army - AM
Navy - AS, OS, SA
Air Force - 01, 02
NSA - NS
DISA - DC
NASA - NA
Others - NIST, DOE, GPO, NCS

User activities:
OASD - IR
Army - AL, AT, AV, ER, GL, ME, MI, MR, SM, TE, TM
Navy - EC, YD
Air Force - 11, 13, 14, 17, 18, 19, 68, 79, 99